

rejection and submit that claims 1-4 and 9 are now in condition for allowance.

Claim 1 recites, in part:

5 [a] micromachining surface treatment material containing less than 0.1% hydrofluoric acid, and more than 40% by weight, but less than or equal to 47% by weight of ammonium fluoride.

10 Applicants submit that such an invention is neither taught, disclosed, nor suggested by Ohmi et al '582 or any of the other cited references, alone or in combination.

Ohmi et al discloses the use of a hydrofluoric acid concentration of 0.1 to 10% by weight and an ammonium fluoride
15 concentration of 15 to 40% by weight. Ohmi et al fails to teach or suggest using both a hydrofluoric acid concentration of less than 0.1% and an ammonium fluoride concentration of greater than 40%. Furthermore, the reference fails to provide any suggestion as to why it would be advantageous to use a hydrofluoric acid
20 concentration lower than that suggested and simultaneously using an ammonium fluoride concentration greater than that proscribed.

The Examiner instead contends that the prior art range is close enough so that one of ordinary skill in the art would have
~~expected concentrations just outside this claimed range to have~~
25 produced similar properties. The Examiner also contends that concentration and composition are commonly determined by routine experimentation and that the process of conducting routine

experimentations so as to produce an expected result is obvious to one of ordinary skill in the art. However, the Examiner has failed to consider that Ohmi et al '582 does not disclose what effects should be expected by varying the concentration of both the hydrofluoric acid and the ammonium fluoride concentrations. As set forth in MPEP 2144.05 (II) (B), a particular parameter must be first recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of that variable might be characterized as routine experimentation. Since Ohmi et al '582 does not disclose or suggest what, if any, result is to be achieved by varying solely the ammonium fluoride concentration, solely the hydrofluoric acid concentration, or both such concentrations, the determination of the optimum or workable ranges of such concentrations cannot be characterized as routine experimentation.

Additionally, the arguments set forth by the Examiner are all essentially based upon case law. Yet, as set forth in MPEP § 2144.04, if Applicant has demonstrated the criticality of a specific limitation, it would not be appropriate to rely solely on

case law as a rationale to support an obviousness rejection.

Applicants submit that having an ammonium fluoride concentration higher than 40% is critical to the invention in that a high concentration thereof slows the etching rate of a CVD film or TEOS film and has sufficient performance with respect to removing a

natural oxidation film (page 6 of the specification, lines 11-17).

From the discussion on pages 12-15 of the specification with respect to Tables 1-4, the use of etchants with a combined HF concentration of less than or equal to 0.1% and an NH_4F

5 concentration in excess of 40% by weight tend to produce etching rates in thermal oxidation, PL-TEOS, and TEOS-BPSG that are close to the etchant rates produced by those etches in a natural oxidation film. Furthermore, such etching concentrations also tend to suppress the widening of contact holes formed in such
10 films, thereby allowing holes of a design diameter to be obtained. Thus, Applicants have established a criticality of the limitations on the etching concentration set forth in claim 1.

Moreover, it is clear that Ohmi et al '582 does not address the issue of how the etching concentration can be adjusted to
15 create more uniform etching rates in various types of oxide films and to suppress the widening of contact holes formed in such oxide films. Ohmi et al clearly does not disclose or suggest that the etching composition can be chosen so as to both suppress the widening of contact holes in the oxide films and to simultaneously
20 ~~effect etching rates that are close to one another for a variety~~
of types of oxide films.

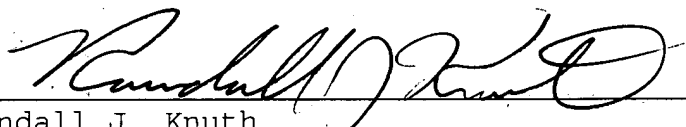
Applicants further hereby incorporate the arguments from our previous response mailed August 15, 2002, set forth with respect to the rejection of claims 1-4 and 9 based upon Ohmi et al '582.

Applicants submit that the arguments set forth therein are still valid and pertinent to the present rejection.

For all the foregoing reasons, Ohmi et al fails to teach the present invention as set forth in claim 1. Accordingly,
5 Applicants submit that claim 1, and claims 2-4 and 9 depending therefrom, are now in condition for allowance and hereby respectfully request that the rejection thereof based upon Ohmi et al be withdrawn.

10 If the Examiner has any questions or comments that would speed prosecution of this case, the Examiner is invited to call the undersigned at 260/485-6001.

Respectfully submitted,


Randall J. Knuth
Registration No. 34,644

RJK/stt10

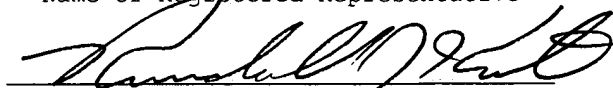
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RANDALL J. KNUTH, P.C.
3510-A Stellhorn Road
Fort Wayne, IN 46815-4631
Telephone: 260/485-6001
Facsimile: 260/486-2794

Randall J. Knuth, Regis. No. 34,644
Name of Registered Representative


Signature
March 4, 2003
Date